

DECLARATION FOR AMENDMENT OF PATENT APPLICATION

As a below named inventor, I hereby declare that my residence, post office address and citizenship are as stated below next to my name.



I am the original, first and sole inventor of the subject matter which is claimed and for which a DIVISIONAL PATENT is sought on the Parent Application 10/293,357, issued as Patent No: 6,736,118

entitled:

FUEL DENSITY REDUCTION METHOD AND DEVICE TO IMPROVE THE
RATIO OF OXYGEN MASS VERSUS FUEL MASS DURING IGNITION IN
COMBUSTION MECHANISMS OPERATING WITH FLUID HYDROCARBON FUELS

the specification of which is herewith requested to be amended as follows:.

On page 1 of the specification, directly below the Title of the Invention, a reference should be inserted connecting the present Application 10/614,004 to its Parent Application as indicated below:

This Application is a Division of Parent Application No: 10,293,357, filed 11/14/2002
Issued May 18, 2004 as US 6,736,118, and is an election of Classification 431

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, code of Federal Regulations, Par. 1.56 (a), and further declare that no new matter is being introduced as part of the amendment.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Inventor

WILLIAM H. VELKE

Inventor's signature

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Claim 1 to 26 CANCELLED

I claim:

27. (New Claim) A method for reducing fuel density while increasing combustion air density, without effecting their specified volume, thereby significantly changing the ratio of fuel mass versus combustion air mass, hence oxygen mass, during the process of ignition and combustion of conventional fluid hydrocarbon fuel such as natural gas, propane gas, fuel oil, coal dust slurry or the like, in combustion mechanisms having a combustion area and burners therein for converting said fuel into energy, such as heat, thrust or torque, comprising:

- a) providing fluid hydrocarbon fuel as fuel for said combustion mechanism;
- b) directing said fuel through the fuel supply conduit functioning as the mechanism's manifold, extending between the fuel delivery valve, being the fuel inlet, and the mechanism's burner arrangement, being the fuel outlet, defining a heat exchanger assembly that extends through a heating zone related to the combustion mechanism;
- c) reducing the fuel density in said fuel delivery manifold by heating the fuel as it flows through said heat exchanger assembly to an optimal fuel operating temperature level ranging between 100 degrees Fahrenheit and the fuel's flash point level;
- c) reducing fuel density in order to improve the ratio of fuel mass versus oxygen mass available in the combustion air volume prior to ignition without increasing combustion air volume;
- e) maintaining a continuous supply of density reduced fuel mass of similar delivery volume to the burners in the combustion area of said combustion mechanism.
- f) maintaining a preselected constant supply of combustion air mass to said combustion area at an increased or at least maintained density level and optimal temperature range of between plus 50 and minus 25 degrees Fahrenheit.

28. (New Claim) A method according to Claim 27, wherein the density reduction of the fuel is stabilized with an insulating or heat storage material forming part of the heat exchanger assembly.

29. (New Claim) A method according to Claim 27, wherein said heating zone is located adjacent the exhaust gas vent area of the combustion mechanism.

30. (New Claim) A method according to Claim 27, wherein said heating zone is located adjacent the combustion area of the combustion mechanism.

31. (New Claim) A method according to Claim 27, wherein said heating zone is located adjacent a heat source other than the combustion or exhaust gas vent area of the combustion mechanism.

32. (New Claim) A method according to Claim 27, wherein said preselected optimal fuel operating temperature range is within the preselected general fuel operating temperature range from 125 degrees to 900 degrees Fahrenheit.

33. (New Claim) A method according to Claim 27, wherein the combustion air is routed through a contained duct system which provides temperature control and the means for air density increase through cooling within a preselected operating temperature range below ambient.

34. (New Claim) A method according to Claim 27, wherein the combustion mechanism converts an oxidation mixture of fuel and air into high temperature high velocity combustion products for the purpose of operating an attached heat transfer system.

35. (New Claim) A device for reducing fuel density while increasing combustion air density, without effecting their specified volume, thereby significantly changing the ratio of fuel mass versus combustion air mass, hence oxygen mass, during the process of ignition and combustion of conventional fluid hydrocarbon fuel, such as natural gas, propane gas, fuel oil or the like, in combustion mechanisms having a combustion area and burners therein for converting said fuel into energy, such as heat, thrust or torque, comprising:

- a) a heat exchanger assembly defining a heating zone;
- b) a fuel supply conduit defining a heat exchanger assembly located in a heating zone related to the combustion area of the equipment, between the mechanism's fuel inlet valve and the burner arrangement, being the fuel outlet area, said heat exchanger assembly providing the conveyance of fluid hydrocarbon fuel to the equipment burner;
- c) means to maintain a continuous supply of fluid hydrocarbon fuel to the burner in the combustion area of said mechanism at a preselected optimal operating temperature level ranging between 100 degrees Fahrenheit and the fuel's flash point level.
- d) means to provide a preselected constant supply of combustion air volume at an increased or at least maintained density level to said combustion area at an

optimal operating temperature range of between plus 50 and minus 25 degrees Fahrenheit.

36. (New Claim) A device according to Claim 35, wherein the insulating material forming part of said heat exchanger assembly balances any temperature fluctuations occurring in the heating zone.
37. (New Claim) A device according to Claim 35, wherein said heating zone is located adjacent the exhaust gas vent area of the combustion mechanism.
38. (New Claim) A device according to Claim 35, wherein said heating zone is located adjacent the combustion area of the combustion mechanism.
- 39 (New Claim). A device according to Claim 35, wherein said heating zone is located adjacent a heat source other than the combustion or exhaust gas vent area of the combustion mechanism.
40. (New Claim) A device according to Claim 35, wherein said means to maintain a continuous supply of fuel to the burners in the combustion area of the mechanism at said optimal fuel temperature level operates within a preselected operating temperature range from above 125 degrees and 900 degrees Fahrenheit.
41. (New Claim) A device according to Claim 35, wherein a preselected volume of combustion air is routed through a contained duct system which provides temperature control and the means for density increase of said combustion air volume at a preselected temperature range below ambient prior to combustion.
42. (New Claim) A device according to Claim 35, wherein the combustion mechanism converts an oxidation mixture of fuel and air into high temperature high velocity combustion products for the purpose of operating an attached heat transfer system.